

CLAIMS:

1. An adaptive filtering device (100), comprising:
at least one adaptive filter (102) for receiving an input signal (101); and
a metering device (104) for receiving an output (103) of the at least one adaptive filter (102),
monitoring a characteristic of the output (103), and forwarding a correction signal (105) in a
5 feedback loop to adjust the characteristic.
2. The adaptive filtering device (100) of claim 1, wherein the at least one
adaptive filter is a low-pass filter, the metering device is a band-pass or high-pass filter and
the characteristic is amount of high frequency in the output and the correction signal raises or
10 lowers the high frequency cut-off of the low-pass filter.
3. The adaptive filtering device (100) of claim 1, wherein the adjusted
characteristic is applied to the input signal block-by-block.
- 15 4. A signal processing device (30), comprising:
a signal processing unit (300) including at least one input and at least one
output; and
the adaptive filtering device (100) of claim 1 for each of the at least one inputs
and at least one outputs.
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5. An adaptive filtering device (200), comprising:
at least two low-pass FIR filters (202, 204) for receiving an input signal (201),
a weighted adder (206) for receiving outputs from each of the at least two low-
pass FIR filters (202, 204) and changing a weighting of each to produce filtered output data
25 (205); and
a controller (208) for receiving at least one cut-off frequency (203), supplying
the cut-off frequency (203) to the at least two low-pass FIR filters (202, 204), and supplying
a signal to the weighted adder (206) for varying the weighting of each of the at least two low-
pass FIR filters (202, 204) to switch between at least two low-pass FIR filters (202,204).

6. The adaptive filtering device (200) of claim 5, wherein the varied weighting is applied block-by-block.
- 5 7. The adaptive filtering device (200) of claim 5, wherein the adaptive filter device (200) operates in a normal mode and a transition mode, wherein the normal mode, the adaptive filter device (200) does not switch filter characteristics and the output of the adaptive filter device (200) is from only one of the at least two low-pass FIR filters (202, 204) and in the transition mode, the adaptive filter device 200 switches filter characteristics
10 and the output of the adaptive filter device (200) is from more than one of the at least two low-pass FIR filters (202, 204).
8. The adaptive filtering device (200) of claim 7, wherein the transition mode, the controller (208) calculates new filter coefficients and loads the new filter coefficients into
15 an unused low-pass FIR filter (204), enables the unused low-pass FIR filter (204), varies the weighting between at least one of the low-pass FIR filters (202) currently being used and the unused low-pass FIR filter (204) to switch therebetween, and disables the at least one of the low-pass FIR filters (204) currently being used.
- 20 9. The adaptive filtering device (200) of claim 8, wherein the controller (208) calculates the new filter coefficients by calculating initial sine and cosine values using an approximation formula and calculating coefficients using a sine prediction filter.
10. The adaptive filtering device (200) of claim 9, wherein the controller (208)
25 calculates coefficients using the sine prediction filter by applying a pre-calculated window function and normalizing the window for unity DC gain.
11. A method of performing adaptive filtering, comprising:
receiving an output (103) of at least one adaptive filter (102),
30 monitoring a characteristic of the output, and
forwarding a correction signal (105) in a feedback loop to adjust the characteristic.

12. The method of claim 11, wherein the at least one adaptive filter (102) is a low-pass filter, and the characteristic is amount of high frequency in the output and the correction signal (105) raises or lowers the high frequency cut-off of the low-pass filter.

- 5 13. A method of performing adaptive filtering, comprising:
receiving outputs from at least two low-pass FIR filters (202, 204) and
changing a weighting of each to produce filtered output data (205);
receiving at least one cut-off frequency (203), supplying the cut-off frequency
(203) to at least one of the at least two low-pass FIR filters (202, 204); and
10 varying the weighting of each of the at least two low-pass FIR filters (202,
204) to switch between at least two low-pass FIR filters (202, 204).

14. The method of claim 13, wherein the method operates in a normal mode and a
transition mode, wherein the normal mode, the method does not switch filter characteristics
15 and the output is from only one of the at least two low-pass FIR filters (202) and in the
transition mode, the method switches filter characteristics and the output is from more than
one of the at least two low-pass FIR filters (202, 204).